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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,259	02/14/2002	Seung-Joon Yang	1293.1289	5059

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EXAMINER	
KOSTAK, VICTOR R	
ART UNIT	**PAPER NUMBER**
2614	

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,259	YANG ET AL.	
	Examiner	Art Unit	
	Victor R. Kostak	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,2 and 4-15* is/are allowed.

6)☒ Claim(s) *16-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Applicant's arguments filed on 03/04/05 with respect to claims 16-25 have been fully considered but they are not persuasive. The previous rejection of these claims accordingly stands and is elaborated on below from the last Office action, with applicant's arguments addressed in the context of the rejection.

2. Regarding a first matter, the examiner regrets being remiss in not citing the de Haan reference on the PTOL-892 form of record. It has been made of record herein.

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 16 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Sezan et al. in view of Hirano et al. (both of record).

Reviewing Sezan, his deinterlacing system of Sezan (noting particularly Figs. 6 and 11) involves estimating motion vectors and their accuracies of a field to be interpolated (for conversion into a progressive format) based on adjacent fields (noting elements 61 – 65). Sezan does account for adjacent fields since he uses three consecutive fields (noting again elements 61-63). Field O1 is adjacent fields E1 and E2.

Element 64 of Sezan is detailed in Fig. 11 and includes estimation of motion vectors using candidate values of a field to be interpolated using motion vectors between fields, and a

decision stage subsequent thereto (as shown), wherein the decision involves determining the existence or absence of global motion based on the estimation (again element 64).

It is noted that claim 16 does not specify some of the elements argued by applicant found in claim 1 (now allowed), including the selection between pixels generated by two different processes. Claim 16 does not definitely recite that two processes are used and then selection is made after the pixels have already been generated. Therefore, Sezan does generate a pixel to be interpolated by a first method of motion compensation according to one the estimated vectors and by a second method using spatially adjacent pixels (e.g. col. 6 lines 50-57), and the better pixel indicated by the estimated accuracy as well as the initial global motion estimation is selected as the interpolated pixel.

Continuing, Sezan uses spatial values for interpolation in his second method (an intrafield method). However, it would have been obvious to one of ordinary skill in the art to use temporal as well as spatial interpolation as disclosed by Hirano (element 2 in Fig. 1: col. 4 lines 14-25), who in a similar deinterlacing system selects between motion vector compensation and adaptive spatiotemporal interpolation based on the amount of motion detected, for the clear benefit of generating a more accurate representation for the interpolated pixel.

Applicant argues that Sezan does not use adjacent (more specifically, preceding and succeeding fields), but he does use (at least) three consecutive fields, and as modified by Hirano, temporal interpolation would involve this sequence of fields, again, which would improve the accuracy of interpolation since motion is accounted for beyond that which can be used involving strictly spatial information. Applicant further argues that Hirano does not use spatio-temporal

processing but uses motion vectors as well, but his motion vectors are used in spatio-temporal interpolation (noting again col. 4 lines 14-25 of Hirano), thereby meeting claim 16.

Applicant does not address the claims remaining rejected individually because he relies on his arguments pertaining to claim 1. Because claims 16-25 do not recite the specifics of claim 1, they remain rejected as presented in the last Office action, repeated therefrom below.

As for claim 17, elements 64 and 65 together function to first identify pixel blocks as exhibiting global motion, and then the accuracy of motion to identify what kind of interpolation, and accordingly what kind of motion, characterized each respective block.

2. Claim 18 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Sezan t al. in view of Hirano et al., and in further in view of De Haan et al.

De Haan also estimates global motion vectors for applications including deinterlacing (e.g. col. 3 lines 32-33), and points out the benefit of histograms in obtaining identifying most accurate vectors for subsequent application (col. 15 lines 9-20).

In view of this explicit benefit, it would have been obvious to one of ordinary skill in the art to use histograms to identify the optimum motion vector from among a group of estimated vectors, in the system of Sezan as modified by Hirano, as specifically taught in the similar system of De Haan, thereby meeting claim 18.

3. Claims 19-25 also stand rejected under 35 U.S.C. 103(a) as being unpatentable over Sezan et al. in view of Hirano et al. and De Haan et al., and in further view of Bozdagi (of record)

As discussed above, De Haan also estimates global motion vectors for applications including deinterlacing (e.g. col. 3 lines 32-33), and points out the benefit of histograms in obtaining identifying most accurate vectors for subsequent application (col. 15 lines 9-20).

In view of this explicit benefit, it would have been obvious to one of ordinary skill in the art to use histograms to identify the optimum motion vector from among a group of estimated vectors, in the system of Sezan as modified by Hirano, as specifically taught in the similar system of De Haan.

Bozdagi also selects between different interpolation methods to deinterlaces a video signal (e.g. Figs. 5-7), and points out that besides any global motion being present, local motion can also be identified.

It would also have been obvious to one of ordinary skill in the art to identify and designate the blocks as exhibiting local (if not global) motion, as taught by Bozdagi, to accurately process the block for interpolation into a sequential format. Likewise it would have been obvious to account for blocks that do not exhibit any motion, thereby accounting for al of the image data that is to be converted, and thereby meeting claims 9 and 19. (As is also explained above, it is noted that although Sezan appears to discuss only global motion, he does in fact identify motion per block which when the image is viewed as a composite block made of contiguous blocks having the same motion accordingly exhibit global motion. When individual blocks exhibit disparate or isolated motion, that is an indication of local motion.)

As for claims 20-25, these situations would all be realized when global/local/zero motion are all to be accounted for, which would have been obvious to one of ordinary skill in the art in order to make sure that all scenarios that can be encountered would indeed be accounted for, the

appropriate deinterlacing method being selected according to the motion threshold being exceeded or not.

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor R. Kostak whose telephone number is (571) 272-7348. The examiner can normally be reached on Monday - Friday from 6:30am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any response to this final action should be mailed to:

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Or faxed to:

(703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 308-HELP.

Victor R. Kostak
Primary Examiner
Art Unit 2614

VRK